

Goal motives and multiple-goal striving in sport and academia

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Running head: GOAL MOTIVATION AND MULTIPLE GOAL STRIVING

Goal Motives and Multiple-Goal Striving in Sport and Academia: A Person-Centered Investigation of
Goal Motives and Inter-Goal Relations

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Running head: GOAL MOTIVATION AND MULTIPLE GOAL STRIVING

Goal Motives and Multiple-Goal Striving in Sport and Academia: A Person-Centered Investigation of
Goal Motives and Inter-Goal Relations

Abstract

Objectives: This investigation extended the goal striving literature by examining motives for two goals being pursued simultaneously. Grounded in Self-Determination Theory, we examined how student-athletes' motives for their sporting and academic goals were associated with inter-goal facilitation and interference.

Design: Cross-sectional survey.

Methods: UK university student-athletes ($n = 204$) identified their most important sporting and academic goals. They then rated their extrinsic, introjected, identified and intrinsic motives for these goals and completed questionnaires assessing inter-goal facilitation and interference.

Results: Using a person-centered approach via latent profile analysis, we identified three distinct profiles of goal motives. Auxiliary analyses showed that the profile with high identified motives for both goals reported greater inter-goal facilitation.

Conclusions: Extending the previous literature, the findings demonstrate the benefits of autonomous motives when simultaneously pursuing goals in sport and academia.

Key words

Goals, motivation, inter-goal facilitation, inter-goal interference, latent profile analysis, self-determination theory

Introduction

Grounded in Self-Determination Theory (SDT)¹, a major principle of the Self-Concordance (SC) model² is that goal motivation can vary in both quality and quantity. Autonomous motivation, reflecting intrinsic and identified motivation regulations, is underpinned by personal interest, importance or enjoyment in goal pursuit. Controlled motivation is underpinned by internal or external pressures, aligned with introjected and extrinsic motivation. SC model-based research has generally examined one goal in a single domain, such as education³, health⁴, and sport^{5,6,7}. In reality, individuals often simultaneously pursue multiple goals across contexts⁸. Only one study has explored motivation in multiple-goal pursuit. Gorges, Esdar and Wild⁹ linked goal self-concordance (autonomous minus controlled motives) to the affective responses associated with multiple goal conflict. To generate feelings of goal conflict, junior scientists considered an instance where they had recently “felt torn” between two activities in their research and teaching. Participants identified a goal and rated their motives for each of these activities. Gorges et al.⁹ found that high goal self-concordance can protect individuals from negative affect when experiencing goal conflict. Further, for self-concordant goals, conflict was viewed as challenging rather than frustrating.

Gorges et al.’s⁹ findings show the importance of identifying the motives underpinning concurrent goal pursuits. However, goal conflict was investigated in one domain only. Furthermore, the relations between goals were not examined. When pursuing multiple goals, individuals may experience inter-goal facilitation or interference¹⁰. Inter-goal facilitation – the pursuit of one goal increasing the chance of success in the other goal - occurs through instrumental relations (progress in one goal resulting in progress towards the other goal) and overlapping goal strategies (actions having positive effects on both goals). Inter-goal interference, whereby pursuing one goal reduces the likelihood of attaining another, operates through resources constraints (striving for one goal detracts time, effort or resources from another goal) or incompatible goal strategies (strategies for one goal conflict with completing another goal). Facilitation is linked with higher levels of goal pursuit,

1 whereas interference is negatively associated with well-being¹⁰. The present study extends the
2 literature by examining the association between goal motivation and inter-goal relations.

3 A central tenet of SDT¹ is that autonomous motivation is more adaptive because it reflects
4 greater integration with the self. As such, autonomous motivation can lead to a range of positive
5 outcomes, and buffer negative outcomes. Conversely, controlled motivation is predicted to lead to
6 negative outcomes, with no buffering effect. Goal motives research has generally supported these
7 propositions^{11,12,13}. Healy et al.⁷ found autonomous goal motives to be positively and negatively
8 related to well- and ill-being, respectively. Furthermore, autonomous motives have been shown to
9 lead to enhanced persistence towards an increasing difficult goal¹¹ and greater flexibility when goals
10 have become unattainable¹⁴. Therefore, it may be that when goals are pursued for reasons of personal
11 importance or enjoyment, individuals can be flexible in their allocation of resources. In a multiple
12 goal context, autonomous motives may allow for greater facilitation between goals. In the present
13 study we expected that autonomous motives would be positively related to inter-goal facilitation and
14 negatively associated with interference. Controlled motivation has generally been found to be
15 unrelated to goal attainment^{12,13}. In a multiple goal context, this might be due to greater interference
16 between goals. Hence, we hypothesized that controlled motives would be positively associated with
17 inter-goal interference, and unrelated to facilitation. We explored these hypotheses in university
18 student-athletes striving for both sporting and academic goals, as while some student -athletes
19 struggle to balance their sporting and academic goals, others are more successful at managing
20 multiple goal pursuits¹⁵. Motivation can vary across different situations and contexts¹⁶, with
21 individuals feeling more autonomous in one context and less so in another. Thus, variations in goal
22 motivation across contexts might be associated with differences in student-athletes' inter-goal
23 relations.

24 In the original SC model, Sheldon and Elliott² combined autonomous and controlled motives
25 to assess self-concordance. Research has also examined autonomous and controlled motives
26 separately to explore their unique contribution to goal-related outcomes^{7,11,12}. However, combinations
27 of goal motives have not been examined in the literature. In the wider SDT literature¹⁷, examining

1 general motivation rather than specific goal motivation, it has been shown that people can experience
 2 varied combinations of motivation regulations. In this study we used a person-centered approach,
 3 whereby we created goal motives profiles for both academic and sporting goals.

4 Within the SDT literature, person-centered research has demonstrated that more optimal
 5 motivation profiles (i.e. high autonomous, low controlled motivation) are associated with better
 6 outcomes (e.g. performance, effort) than those with less optimal profiles (i.e. low autonomous, high
 7 controlled motivation or moderate autonomous, moderate controlled motivation)^{17,18}. However, other
 8 research has suggested that high levels of controlled motivation may not be detrimental, as long as
 9 autonomous motivation regulations are also high^{19,20,21}. Within our research, it was also plausible that
 10 individuals would report different combinations of goal motives across their academic and sporting
 11 goals. For example, student-athletes might enjoy their sporting goal, and therefore report higher levels
 12 of autonomous and lower levels of controlled motives in pursuit of this goal, whereas they might be
 13 pursuing their academic goal with different levels of autonomous and controlled motives. We
 14 expected that profiles in which intrinsic and identified goal regulations (i.e., autonomous motives) for
 15 both goals were high, would experience greater inter-goal facilitation and lower interference,
 16 regardless of the level of extrinsic and introjected (i.e., controlled) motivation. Additionally, we
 17 hypothesized that profiles with lower levels of autonomous goal motives, or with mixed motives for
 18 sporting and academic goals, would experience less inter-goal facilitation and more interference.

19 **Methods**

20 Following ethical approval from two UK universities, we recruited 204 university students
 21 (103 male, 101 female, *M*_{age} = 21.00 years, *SD*_{age} = 2.09) who had been participating in their sport
 22 for 7.69 ± 5.29 years. A questionnaire pack was completed either online or on paper. Data collection
 23 occurred around 4-6 weeks into an academic semester, as we felt that students would have
 24 commenced goal striving for both goals by this point.

25 Participants identified their most important sporting and academic goal for the remaining
 26 academic year, and rated their motivation for each goal. Four items (one for each goal motivation
 27 regulation) that have been used extensively in previous goal striving research^{2,7,12}, tapped extrinsic

(“Because someone else wants you to”), introjected (“Because you would feel ashamed, guilty, or anxious if you didn’t”), identified (“Because you personally believe it’s an important goal to have”) and intrinsic (“Because of the fun and enjoyment the goal provides you”) goal motives on a 1 (*not at all*) to 7 (*very much so*) scale. .

The Inter-goal Relations Questionnaire¹⁰ was completed to assess facilitation and interference. The facilitation scale had one item each for instrumental goal relations (“The pursuit of my sporting goal sets the stage for the realization of my academia goal”) and overlapping goal attainment strategies (“How often has it happened that you did something in the pursuit of your sporting goal that was simultaneously beneficial for your academic goal?”). For the interference scale, three items assessed resource constraints (e.g., “How often has it happened that because of the pursuit of your sporting goal, you could not invest as much energy into your sporting goal as you would have liked to?”), and a fourth measured incompatible goal attainment strategies (“How often has it happened that you did something in the pursuit of your academic goal that was incompatible with your sporting goal?”). Participants rated the impact of the sporting goal on their academic goal, and vice versa, in reference to the last month on a 1 (*Never or rarely*) to 5 (*Very often*) scale. For each goal, mean facilitation and interference scores were created from the respective items.

To create goal motives profiles, latent profile analysis (LPA) was performed using MPlus 7.1²² with MLR estimation. We included in the analysis the four motivation regulations for each goal; eight variables were used in total. This approach is different to previous SC model research^{7,11,12}, where the extrinsic and introjected, and identified and intrinsic scores have been aggregated to form controlled and autonomous goal motives respectively. Our approach was based on two reasons. First, the four items represent separate (albeit related) motivation regulations. Additionally, research has often found these goal motives aggregates have poor internal reliability^{7,11}.

While there is no “gold standard” for determining the optimum number of profiles in LPA, it is worthwhile to explore a range of solutions and select the number of profiles based on the goodness-of-fit indices, the nature of the profiles, and theoretical considerations^{23,24}. It is also possible to test if a more complex model offers a better fit to the data than a more parsimonious one. We examined the

model fit criteria from 1-5 profile solutions. We primarily used the bootstrapped log-likelihood ratio test (BLRT) as this is recommended for sample sizes of $n < 200$ ²⁵. We also inspected the entropy criterion values; higher values indicate a better model fit²⁶. Furthermore, the goal motives means for each profile were examined in terms of relevance to theory. To examine between profile differences in inter-goal interference and facilitation, we utilized the AUXILIARY command in MPlus. This allows for the equality of outcome means hypothesis to be tested across profiles via a Wald chi-square test²⁷.

Results

The data were screened for multivariate outliers using Mahalanobis distance. Consequently, we removed 9 participants, leaving a final sample of 195 participants. The internal reliabilities for both facilitation variables were slightly lower than those for the interference variables (Table 1). This may be explained by the facilitation subscale containing two items only whereas the interference subscale contained four items²⁸.

We conducted preliminary analyses to ensure the LPA would not be impacted by confounding variables. None of the goal motive regulations were correlated with the participants' age or years of experience in their sport (Table 1). There was a small, negative correlation between age and facilitation from the sporting goal to the academic goal; however, no other variables were related to age or years of experience. A MANOVA revealed no multivariate (Pillai's $V = .06$, $F(12,182) = .99$, $p = 0.46$, $\eta^2 = .06$) or univariate between gender differences in sport goal motives (all $F(1,195) < 2.23$, $p > 0.05$, $\eta^2 < .02$), academic goal motives (all $F(1,195) < 1.82$, $p > 0.05$, $\eta^2 < .01$) or inter-goal relations (all $F(1,195) < 2.60$, $p > 0.05$, $\eta^2 < .02$).

Table 2 displays the fit indices for the LPA. Using the BLRT, entropy values and theoretical considerations, we accepted the 3-profile solution (Figure 1A). In all three profiles, participants reported relatively adaptive motives for their sporting goal (i.e. lower extrinsic and introjected, and higher identified and intrinsic motives). The academic goal motives across the profiles were more diverse. In Profile 1 (10.3% of the sample), individuals reported low extrinsic, moderate introjected and high identified and intrinsic motives for the sport goal. For the academic goal, they reported

1 moderate levels of all goal motive regulations. Therefore, this profile was labeled as “Mixed-Motive
2 Strivers”. In Profile 2 (25.1%) individuals reported low extrinsic and introjected, moderate identified
3 and high intrinsic motives for their sporting goal. For their academic goal, they reported high
4 identified, and moderate extrinsic, introjected and intrinsic motives. This profile was labeled
5 “Intrinsic-Identified Motive Strivers”. The final profile was the largest (64.6%). Individuals within
6 this group pursued their sporting goal with low extrinsic and introjected, and high identified and
7 intrinsic motives. They also reported high identified motives for their academic goal, along with
8 moderate levels of extrinsic, introjected and intrinsic motives. Given their high level of identified
9 motivation for both goals, we labeled this class as “Dual-Identified Motive Strivers”.

10 The results of the AUXILIARY analyses (Figure 1B) showed that all profiles reported similar levels
11 of academic to sporting (Global Wald $\chi^2 = 1.68$, $p = 0.43$) and sporting to academic (Global Wald $\chi^2 =$
12 2.60 , $p = 0.21$) goal interference. Different levels of facilitation were reported between the profiles.
13 From the academic to the sporting goal, the “Mixed-Motive Strivers” reported lower levels of
14 facilitation than both the “Intrinsic-Identified Motives Strivers” (Wald $\chi^2 = 11.0$, $p = 0.001$, Cohen’s d
15 $= .75$) and the “Dual-Identified Motive Strivers” (Wald $\chi^2 = 23.68$, $p < 0.001$, Cohen’s $d = .98$), with
16 no difference between the latter two profiles (Wald $\chi^2 = .70$, $p = 0.41$, Cohen’s $d = .15$; Global Wald
17 $\chi^2 = 23.74$, $p < 0.001$). For facilitation from the sporting to the academic goal, the “Dual-Identified
18 Motive Strivers” reported higher facilitation than both the “Mixed-Motive Strivers” (Wald $\chi^2 = 4.38$, p
19 $= 0.04$, Cohen’s $d = .50$) and the “Intrinsic-Identified Motive Strivers” (Wald $\chi^2 = 4.81$, $p = 0.03$,
20 Cohen’s $d = .37$). There were no differences between the latter two profiles (Wald $\chi^2 = .29$, $p = 0.59$,
21 Cohen’s $d = .14$; Global Wald $\chi^2 = 7.67$, $p = 0.02$). To summarize, we found partial support for our
22 hypotheses, as the profiles with higher levels of autonomous goal motives for their goals experienced
23 greater facilitation, but there were no differences in interference.

24
25

Discussion

This was the first study to explore combinations of motivation regulations for sporting and academic goals. Our results suggest that facilitation between goals occurs when identified goal motives are high. Within the “Dual-Identified Motive Strivers” and “Intrinsic-Identified Motive Strivers” profiles, individuals reported high identified motives for their academic goal. Furthermore, they experienced greater facilitation from their academic goal to their sporting goal than the “Mixed-Motives Strivers”, who reported moderate identified goal motives. Similarly, only the “Dual-Identified Motive Strivers” reported high identified sport goal motives. Individuals within this group experienced greater facilitation from their sporting goal to their academic goal than the “Mixed-Motive Strivers” and the “Intrinsic-Identified Motive Strivers”.

Research from the SDT literature has shown that identified and intrinsic motivation regulations can lead to different outcomes²⁹. It has also been suggested that identified motivation might be more beneficial than intrinsic motivation when tasks are not perceived to be inherently interesting¹⁶. It is plausible that for our participants, their sporting goal was more inherently enjoyable than their academic goal. As such, understanding the importance of achieving both goals may have resulted in facilitation between both the sporting and academic goal. Given that facilitation is positively linked with goal progress¹⁰, it could be expected that when individuals find personal importance in their goal pursuits, they experience benefits such as inter-goal facilitation, enabling them to successfully achieve multiple goals.

An interesting aspect of our findings is that the “Dual-Identified Motive Strivers” reported moderate levels of controlled (e.g. extrinsic and introjected) motives for their academic goal. Indeed, individuals within this group reported the highest level of introjected motives for the academic goal of the three profiles. Despite feeling internal pressures to pursue their academic goal, student-athletes within this profile reported the highest levels facilitation. These findings are aligned with the SDT literature. Studies in physical education have shown that students with higher autonomous motivation reported more adaptive experiences, regardless of their controlled motivation levels^{17,18}. In a sport

1 setting, no differences were found in objectively-assessed performance between two profiles with
 2 high autonomous motivation, which had varying levels of controlled motivation²⁰. Recent research in
 3 sport which explored motivation profiles in relation to well-being has suggested that high controlled
 4 motivation can lead to adaptive outcomes when coupled with high autonomous motivation²¹. In
 5 multiple goal pursuit, it seems that introjected motives are not detrimental to facilitation, as long as
 6 both goals are perceived to be personally important.

7 Contrary to our expectations, our findings suggest that differences in goal motivation profiles
 8 are not associated with differential levels of inter-goal interference. Individuals in all profiles reported
 9 moderate levels of interference between their academic and sporting goals. This suggests that, in
 10 relation to the pursuit of multiple goals across domains, more adaptive forms of motivation cannot
 11 protect individuals from interference, contrary to the tenets of SDT¹. It may be that in goal pursuit
 12 across multiple domains, high autonomous motivation does not have the same buffering effect as
 13 found in previous literature looking at motivation for pursuits within the same domain⁷. This
 14 unexpected finding warrants investigation to fully understand the association between goal motivation
 15 and inter-goal relations in multiple domains.

16 This study makes a novel contribution to the literature by examining goal motives in multiple-
 17 goal situations. However, as the analyses used cross-sectional data, we were unable to determine if
 18 goal motives can prospectively predict multiple goal attainment. Given that facilitation is positively
 19 associated with goal progress¹⁰, we might infer from our findings that, over time, those with an
 20 adaptive goal motive profile would have higher levels of attainment for both goals. It is important that
 21 research examines the associations between goal motives, inter-goal relations, and goal attainment via
 22 a longitudinal design. A further limitation is the use of single-item measures for each goal motivation
 23 regulation. While this approach is consistent with the literature^{2,7,12}, it would be worthwhile to develop
 24 multiple items for each goal motive and incorporate these into future research.

25 Research could also examine how an individual's goal motives can explain differences in
 26 inter-goal relations when pursuing multiple goals in a single domain. In sport, goal setting may be
 27 more effective when athletes set goals to work towards across different sport-related contexts (e.g.

training and competition) and over different time scales (e.g. short-, medium- and long-term)³⁰.

Pursuing these questions would extend the SC model research conducted to date.

Conclusion

Our findings extend the SC model literature by showing that adaptive goal motivation is also important in multiple-goal pursuit, particularly in relation to facilitation of academic and sporting goals. To find balance in pursuits across different settings, it is important for individuals to find personal importance in their goals within each domain.

Practical implications

- Student-athletes strive for their sporting and academic goals for different reasons
- To experience optimum relations between sporting and academic goals, student-athletes should try to find personal importance in both goals
- Striving for goals as a result of pressure or for the avoidance of unpleasant emotions may not necessarily be detrimental for goal relations, as long as the goals are also important to the individual.

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References

1. Deci EL, Ryan RM. The “What” and “Why” of goal pursuits: Human needs and the self-determination of behaviour. *Psychol Inq* 2000; 11(4); 227-268.
2. Sheldon KM, Elliot AJ. Goal striving, need satisfaction, and longitudinal well-being: The self-concordance model. *J Pers Soc Psychol* 1999; 76(3); 482-497.
3. Ntoumanis N, Healy LC, Sedikides C et al. When the goal gets tough: The “why” of goal striving matters. *J Pers* 2014; 82(3); 225-236.
4. Smith A, Ntoumanis N, Duda JL. Goal striving, goal attainment, and well-being: Adapting and testing the self-concordance model in sport. *J Sport Exercise Psy* 2007; 29(6); 763-782.
5. Koestner R, Otis N, Powers TA et al. Autonomous motivation, controlled motivation, and goal progress. *J Pers* 2008; 76(5); 1201-1229.
6. Vasalampi K, Nurmi, JE, Jokisaari M et al. The role of goal-related autonomous motivation, effort and progress in the transition to university. *Eur J Psychol Educ* 2012; 27(4); 591-604.
7. Miquelon P, Vallerand RJ. Goal motives, well-being, and physical health: Happiness and self-realization as psychological resources under challenge. *Motiv Emotion* 2006; 30(4); 259-272.
8. Smith A, Ntoumanis N, Duda J. An investigation of coach behaviors, goal motives, and implementation intentions as predictors of well-being in sport. *J Appl Sport Psychol* 2010; 22(1); 17-35.
9. Smith A, Ntoumanis N, Duda JL et al. Goal striving, coping, and well-being. A prospective investigation of the self-concordance model in sport. *J Sport Exercise Psy* 2011; 33(1); 124-145.
10. Healy LC, Ntoumanis N, Veldhuijzen van Zanten JJCS et al. Goal striving And well-being in sport: The role of contextual and personal motivation. *J Sport Exercise Psy* 2014; 36(5); 446-459.
11. Louro MJ, Pieters R, Zeelenberg M. Dynamics of multiple-goal pursuit. *J Pers Soc Psychol* 2007; 93(2); 174-193.

- 1 12. Gorges J, Esdar W, Wild W. Linking self-concordance and affective responses to goal
2 conflict. *Motiv Emotion* 2014; 38(4); 475-484.
- 3 13. Riediger M, Freund AM. Interference and facilitation among personal goals: Differential
4 associations with subjective well-being and persistent goal pursuit. *Pers Soc Psychol B* 2004;
5 30(12); 1511-1523.
- 6 14. Ntoumanis N, Healy LC, Sedikides C. Self-regulatory responses to unattainable goals: The
7 role of goal motives. *Self Identity* 2014; 13(5); 594-612.
- 8 15. Cosh S, Tully PJ. "All I have to do is pass". A discursive analysis of student athletes' talk
9 about prioritising sport to the detriment of education to overcome stressors encountered in
10 combining elite sport and tertiary education. *Psychol Sport Exerc* 2014; 15(2); 180-189.
- 11 16. Vallerand RJ. A hierarchical model of intrinsic and extrinsic motivation in sport and exercise,
12 Chapter 8 in *Advances in Motivation in Sport and Exercise*, Treasure GC, editor, Champaign,
13 IL, Human Kinetics Publishers, 2001, p. 263-319.
- 14 17. Vansteenkiste M, Sierens E, Soenens B et al. Motivational profiles from a self-determination
15 perspective: The quality of motivation matters. *J Edu Psychol* 2009; 101(3); 671-688.
- 16 18. Ullrich-French S, Cox A. Using cluster analysis to examine the combinations of motivation
17 regulations of physical education students. *J Spor Exercise Psy* 2009. 31(3); 358-379.
- 18 19. Van den Berghe L, Soenens B, Aelterman N et al. Within-person profiles of teachers'
19 motivation to teach: Associations with need satisfaction at work, need-supportive teaching,
20 and burnout. *Psychol Sport Exerc* 2014; 15(4); 407-417.
- 21 20. Gillet N, Vallerand RJ, Paty, B. Situational motivational profiles and performance with elite
22 performers. *J Appl Soc Psychol* 2013; 43(6); 1200-1210.
- 23 21. Langan E, Hodge K, McGown S et al. The influence of controlled motivation alongside
24 autonomous motivation: Maladaptive, buffering, or additive effects? *Int J Sport Exerc*
25 *Psychol* 2015; doi: 10.1080/1612197X.2015.1016084
- 26 22. Muthén LK, Muthén BO. *Mplus user's guide*. Los Angeles, CA, Muthén & Muthén. 1998-
27 2011.

- 1 23. Gerber M, Jonsdottir I H, Lindwall M et al. Physical activity in employees with differing
2 occupational stress and mental health profiles: A latent profile analysis. *Psychol Sport Exerc*
3 2014; 15(6); 649-658.
- 4 24. Marsh HW, Lüdtke O, Trautwein U et al. Classical latent profile analysis of academic self-
5 concept dimensions: Synergy of person- and variable-centred approaches to theoretical
6 models of self-concept. *Struc Equ Modeling*, 2009; 16(2); 191-225.
- 7 25. Nylund KL, Asparouhov T, Muthén BO. Deciding on the number of classes in latent class
8 analysis and growth mixture modeling: A Monte Carlo Simulation study. *Struc Equ Modeling*
9 2007; 14(4); 535-569.
- 10 26. Aldrige AA, Roesch SC. Developing coping typologies of minority adolescents: A latent
11 profile analysis. *J Adolescence* 2008; 31(4); 499-517.
- 12 27. Morin AJS, Morizot J, Boudrias J-S et al. A multifoci person-centred perspective on
13 workplace affective commitment: A latent profile/factor mixture analysis. *Organ Res*
14 *Methods* 2011; 14(1); 58-90.
- 15 28. Cortina JM. What is a coefficient alpha? An examination of theory and applications. *J Appl*
16 *Psychol* 1993; 78(1); 98-104.
- 17 29. Burton KD, Lydon JE, D'Alessandro DU et al. The differential effects of intrinsic and
18 identified motivation on well-being and performance: Prospective, experimental and implicit
19 approaches to Self-Determination Theory. *J Pers Soc Psychol* 2006; 91(4); 750-762.
- 20 30. Weinberg RS. Goal setting in sport and exercise: Research and practical applications. *Rev*
21 *Educ Fisica* 2013; 24(2); 171-179.
- 22

1
2 Figure 1. Mean goal motivation regulations (1A) and mean (\pm SEM) inter-goal interference and
3 facilitation (1B) across the different profiles. a = significantly different means to other profiles $p <$
4 0.05
5

1 Table 1.

2 *Descriptive Statistics, Scale Reliabilities and Bivariate Correlations of Study Variables.*

	α	M (SEM)	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Age (years)	-	21.02 (.15)	-												
2. Years of experience in main sport	-	7.69 (.38)	.20 ^b	-											
3. Sport extrinsic goal motives	-	2.30 (.11)	-.08	-.09	-										
4. Sport introjected goal motives	-	2.70 (.13)	-.05	-.09	.45 ^b	-									
5. Sport identified goal motives	-	5.93 (.09)	.01	.02	-.05	.14 ^a	-								
6. Sport intrinsic goal motives	-	6.24 (.07)	-.05	.09	-.21 ^b	-.22 ^b	.31 ^b	-							
7. Academic extrinsic goal motives	-	3.13 (.13)	-.03	-.002	.38 ^b	.16 ^a	.16 ^a	-.03	-						
8. Academic introjected goal motives	-	4.43 (.13)	-.01	-.06	.17 ^a	.35 ^b	-.01	-.12	.24 ^b	-					
9. Academic identified goal motives	-	6.53 (.05)	.03	-.06	.06	.17 ^b	.29 ^b	.04	.10	.26 ^a	-				
10. Academic intrinsic goal motives	-	4.53 (.12)	-.02	-.003	-.16 ^a	-.02	-.04	.27 ^b	-.17 ^a	-.15 ^a	.24 ^a	-			
11. Academic to sport goal interference	.76	2.80 (.07)	.05	.05	.04	.12	-.08	-.03	-.07	.02	-.15 ^a	-.07	-		
12. Academic to sport goal facilitation	.65	2.52 (.07)	-.04	-.01	-.16 ^a	-.07	.26 ^b	.24 ^b	-.03	.11	.12	.06	.05	-	
13. Sport to academic goal interference	.73	2.70 (.06)	-.06	-.11	.09	.10	.02	-.13	.11	.10	.08	-.02	.19 ^a	-.03	-
14. Sport to academic goal facilitation	.63	2.62 (.07)	-.16 ^a	.01	.08	.11	.20 ^b	.13	.06	.14	.05	.15 ^a	.11	.58 ^b	.24 ^b

- 1 *Note:* The goal motives variables were all assessed on a 1-7 scale. The inter-goal interference and facilitation were measured on a 1-5 scale. M = mean, SEM
- 2 = standard error of the mean. ^a $p < 0.05$, ^b $p < 0.01$

1 Table 2.

2 *Fit Indices, Entropy, and Model Comparisons for Estimated Latent Class Analysis Models*

Model	BLRT	BIC	SSA-BIC	Entropy	LMR test
One class	-	5559.26	5508.57	1.00	-
Two classes	-2737.44*	5471.69	5392.50	.92	132.23*
Three classes	-2669.94*	5220.67	5112.96	1.00	292.32
Four classes	-2520.69*	5208.17	5071.96	.88	58.94
Five classes	-2490.72*	5205.51	5040.78	.90	49.35

3

4 *Note.* BLRT = Bootstrapped loglikelihood ratio test; BIC = Bayesian Information Criterion; SSA-BIC = Sample Size Adjusted Bayesian Information

5 Criterion; LMR = Lo-Mendell-Rubin likelihood ratio test.

6 * $p < 0.01$

7

8



